

WHAT IS CLAIMED IS:

sub 1.7

- 5 1. An ink jet head deforming a pair of partition walls sandwiching a trench-like ink chamber to discharge ink from said ink chamber by having an inside electrode formed in the ink chamber at each inner side plane of said pair of partition walls and electrically connected to an external drive circuit, and applying a driving pulse from said external drive circuit to said inside electrodes, comprising:

a substrate having said partition wall constituted by forming an ink chamber trench from one end plane to another end plane,

- 10 wherein an end plane of said inside electrode located only within said ink chamber trench is exposed at said another end plane, said external drive circuit is electrically connected to said inside electrode at said another end plane, and an ink supply opening to supply ink to said ink chamber is provided at said another end plane side.

2. The ink jet head according to claim 1, further comprising a cover plate attached at a surface of said substrate where said ink chamber trench is formed,

- 5 wherein said ink supply opening is provided at least at said cover plate side.

3. The ink jet head according to claim 1, further comprising a filling member formed between said pair of partition walls at said another end plane of said ink chamber trench.

4. The ink jet head according to claim 1, further comprising a protection film to protect a connection portion where said inside electrode and said external drive circuit are electrically connected via said filling member having conductivity.

5. The ink jet head according to claim 1, wherein said filling member is formed of a conductive material, and said external drive circuit

and said inside electrode are electrically connected via said filling member.

6. The ink jet head according to claim 5, wherein said filling member includes a conductive resin occluding said ink chamber trench at said another end plane between said pair of partition walls.

7. The ink jet head according to claim 6, wherein said filling member includes a conductive filler of a predetermined material and a predetermined configuration.

8. The ink jet head according to claim 5, wherein said filling member is solder occluding said ink chamber trench between each inside electrode formed at each wall plane of said pair of partition walls at said another end plane.

9. The ink jet head according to claim 5, wherein said filling member is electrically connected to a connection terminal of said external drive circuit at a region exposed at said ink chamber trench.

10. The ink jet head according to claim 5, wherein said filling member is a connection terminal of said external drive circuit inserted into said another end plane of said ink chamber trench.

11. The ink jet head according to claim 5, wherein said filling member includes a conductive resin occluding said ink chamber trench between each said inside electrode formed at each wall plane of said pair of partition walls at said another end plane, and a connection terminal of said external drive circuit inserted into said another end plane of said ink chamber trench.

12. The ink jet head according to claim 5, wherein said filling member occluding said ink chamber trench between each said inside electrode formed at each wall plane of said pair of partition walls is an

anisotropic conductive adhesive.

13. The ink jet head according to claim 10, wherein one of said inside electrode and said filling member is deformed by abutment with the other of said inside electrode and said filling member during insertion of said filling member into said another end plane of said ink chamber trench.

14. The ink jet head according to claim 5, wherein a guide portion of a configuration to guide said filling member into said ink chamber trench is formed at said another side plane of said ink chamber trench.

15. The ink jet head according to claim 1, further comprising a connection conductor layer electrically connected to said inside electrode, wherein an end plane of said connection conductive layer located at only inside said ink chamber trench is exposed at said another end plane, and electrical connection with said external drive circuit is established at the exposed end plane of said connection conductor layer.

16. The ink jet head according to claim 1, wherein an area of a cross section of the end plane of said inside electrode exposed at said another end plane is at least  $7 \times 10^{-5} \text{ mm}^2$ .

17. The ink jet head according to claim 15, wherein at least one of said inside electrode and said connection conductor layer includes a plating metal film at its surface.

18. The ink jet head according to claim 1, further comprising a filling member to establish occlusion between said pair of partition walls at said another end plane of said ink chamber trench, wherein said filling member includes a substance of one of a conductive resin and an insulative resin.

19. The ink jet head according to claim 18, wherein said filling

member has characteristics of at least an elastic modulus of not more than 10 GPa under an environment of not more than 100°C and a coefficient of linear expansion of not more than 50 ppm/°C under an environment of not more than 100°C.

20. The ink jet head according to claim 15, wherein each inside electrode formed at each inner side plane of said pair of partition walls is electrically connected by said connection conductor layer formed along an inner wall plane of said ink chamber trench.

21. A method of fabricating an ink jet head comprising the steps of:  
forming a plurality of ink chamber trenches at a predetermined pitch on a top plane of a channel wafer of a piezoelectric element subjected to a polarization process in a thickness direction,

forming an inside electrode independent to each other at each of facing planes of each of said plurality of ink chamber trenches,  
attaching a cover wafer at said top plane of said channel wafer, and  
cutting and dividing said channel wafer and said cover wafer after said attachment in a direction crossing a longitudinal direction of said ink chamber trench, and forming an opening of an ink supply opening at a cut plane thereof.

22. The method of fabricating an ink jet head according to claim 21, further comprising the step of forming a filling member of a conductive material having a predetermined width to establish occlusion between said inside electrodes of said facing planes at one or a plurality of positions of said plurality of ink chamber trenches.

23. The method of fabricating an ink jet head according to claim 22, wherein said step of forming a filling member includes the step of fusing solder which is said conductive material by light energy.

24. The method of fabricating an ink jet head according to claim 22, wherein said step of forming a filling member includes the step of cooling a portion of said channel wafer where said filling member is not inserted.

25. The method of fabricating an ink jet head according to claim 21, further comprising the step of forming a connection conductor layer along an inner wall plane of said ink chamber trench,

5 wherein said inside electrode is formed so as to come into contact with said connection conductor layer

26. The method of fabricating an ink jet head according to claim 21, further comprising the step of forming a filling member so as to fill a predetermined region between said inside electrodes facing each other in each of said plurality of ink chamber trenches,

5 wherein said channel wafer and said cover wafer after said attachment is cut at a position of cutting said filling member.